

FISHES OF THE BULLOO-BANCANNIA DRAINAGE DIVISION

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Fish were sampled from the Bulloo River in the Bulloo-Bancannia drainage division during 1986 and 1989. Seven indigenous species, in six families, were recorded: *Nematalosa erebi*, *Neosilurus* sp., *Hypseleotris* sp., *Melanotaenia splendida tatei*, *Macquaria ambigua*, *Leiopotherapon unicolor* and *Bidyanus welchi*. Museum records added *Mogurnda adspersa* and the exotic *Gambusia affinis*. The depauperate fish fauna is probably due to the small size and ephemeral nature of the division. No species is endemic to the Bulloo Division, but five other species which occur in both adjacent drainage divisions, Lake Eyre and Murray-Darling, were not recorded; there has been no mixing of fishes between the divisions in recent times.

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More than 70% of Australia is arid or semi-arid (Barker and Greenslade 1982) so there is a paucity of permanent freshwater fish habitats in the internal drainage divisions (Fig. 1).

Although the fishes of the Western Plateau, Lake Eyre and Murray-Darling divisions have been recorded (Lake 1971, 1978; Glover and Sim 1978; Glover 1979, 1982; McDowall 1980; Merrick and Schmida 1984) little is known of the fish fauna of the Bulloo-Bancannia division which lies between the Lake Eyre and Murray-Darling divisions. Lake (1971) presumed that *Nematalosa erebi*, *Ambassis castelnaui*, *Macquaria ambigua*, and *Leiopotherapon unicolor* were found in the Bulloo division, and more recent reviews by Lake (1978), Llewellyn and Pollard (1980) and Merrick and Schmida (1984) added *Neosilurus argenteus*, *Neosilurus* sp. 2, *Bidyanus welchi* and *Scortum barcoo*.

An extensive survey of the freshwater fishes of inland Queensland and the Northern Territory has been conducted by S.H.M. and M.M. This paper reports the fishes sampled from the Bulloo-Bancannia division in 1986 and 1989. Limnology of the Bulloo River is briefly described.

MATERIALS AND METHODS

This elongated drainage division (Fig. 1) has an area of c. 100,000 km² and is comprised of two internal basins (Anon, 1967). The Bulloo River drains the northern part of the division after occasional periods of general runoff and

ends in shallow ephemeral marshlands near the Queensland border. The river is normally a chain of widely separated waterholes, many of which are ephemeral. In the southern part of the division indefinite drainage enters several depressions; this area is the Bulloo Overflow. Evaporation rates far exceed rainfall; runoff occurs only after occasional periods of heavy rain, resulting in extensive shallow flooding.

SAMPLING

Fish were sampled during day and night using dip nets, gill nets (75 and 112 mm mesh) seine nets (5 and 12 mm), and hook and line. The relative abundance of each species was categorised as abundant, common or rare. The sampling effort was similar in both years. Sub-samples of each species were preserved in 10% formalin. Water quality variables were measured using a secchi disc, thermometer, appropriate meters and Hach titration equipment.

1986

Fish were sampled during September from a permanent hole (3 km x 40 m) in the Bulloo River, c. 50 km WSW of Thargomindah, 28°10'S, 143°22'E (Fig. 1). The river had only recently stopped flowing after rains (100-150 mm) in May, June and July.

1989

Fish were sampled during September from the

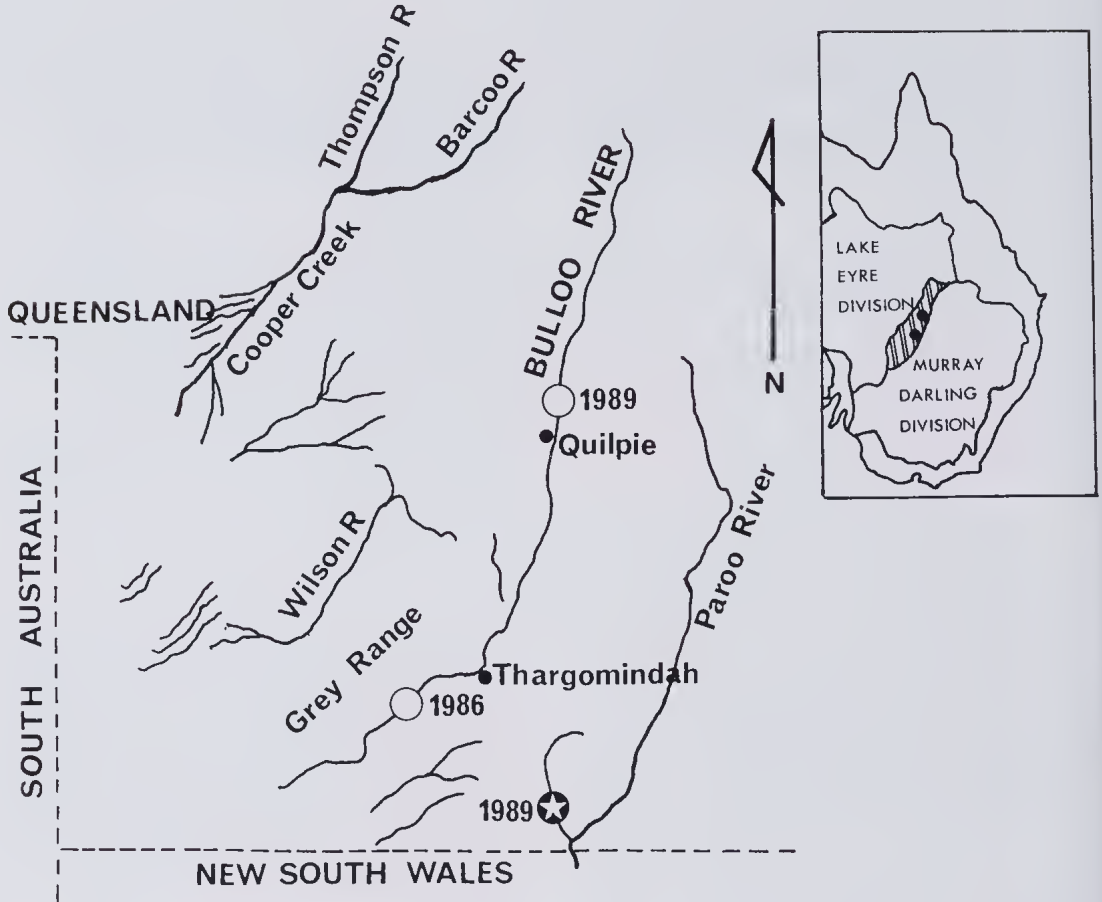


FIG. 1. Sampling sites in the Bulloo River (○); and the Boorara Creek (⊙). Inset showing internal drainage divisions of Australia.

permanent "Como Hole" (1.5 km x 30 m) in the Bulloo River, approximately 25 km N of Quilpie, 26°23'S, 144°18'E (Fig. 1). The river had flooded during May, 1989, but when sampled was a series of widely separated waterholes.

MUSEUM RECORDS

Queensland Museum (QM): *Neosilurus* sp. (QMI20400), *Melanotaenia splendida* (QMI20398), *Macquaria ambigua* (QMI14182, QMI20399, QMI20406, QMI20412), *Morgurnda adspersa* (QMI8002; a single specimen from the Bulloo River in 1955).

Australian Museum (AM): *Nematalosa erebi* (AMI16006-001, AMI18928-001, AMI19059-003), *Neosilurus* sp. (AMI19058-002, AMI19059-002, AMI21690-002, AMI27071-001), *Gambusia affinis* (AMI19059-001; from the Bulloo River Overflow, near Clifton Bore,

in 1976), *Melanotaenia* sp. (AMI 18928-002), *Macquaria ambigua* (AMI16006-002, AMI21690-001, AMI21694-001), *Leiopotherapon unicolor* (AMI18927-001, AMI18928-003, AMI19058-001, AMI19059-004).

South Australian Museum (SAM): *Melanotaenia* sp., *Hephaestus* sp. (probably *Bidyanus* sp.).

RESULTS AND DISCUSSION

Seven indigenous species, in six families and seven genera were recorded (Table 1).

There is uncertainty about the taxonomic status of some fishes in inland Australia, particularly the neosilurids and the eleotrids (Lake, 1978; Hoese et al., 1980; Merrick and Schmida, 1984) and major taxonomic reviews are underway (R. McKay, pers. comm.). Although

Family	Species Name	Common Name	Relative Abundance*		Remarks ¹
			1986	1989	
Clupeidae	<i>Nematalosa erebi</i>	bony bream	A	A	occurs in WP, LE, BB
Plotosidae	<i>Neosilurus</i> sp.	catfish	R	—	
Eleotridae	<i>Hypseleotris</i> sp.	gudgeon	R	C	1st record in BB
Melanotaenidae	<i>Melanotaenia splendida tatei</i>	desert rainbow fish	R	R	1st record in BB endemic to WP, LE, BB
Percichthyidae	<i>Macquaria ambigua</i>	golden perch	R	C	
Teraponidae	<i>Leiopotherapon unicolor</i>	spangled perch	C	—	occurs in WP, LE, BB
	<i>Bidyanus welchi</i>	Welch's grunter	—	R	

* A - abundant, C - common, R - rare.

1WP = Western Plateau; LE = Lake Eyre; BB = Bulloo-Bancannia Drainage Divisions.

TABLE 1. Fishes sampled from the Bulloo River

Llewellyn and Pollard (1980) recorded *Neosilurus argenteus* from two bore tanks east of Milparinka in the catchment of the Bulloo system, this catfish is unlikely to be *N. argenteus* (R. McKay pers. comm.). In the current study, *M. splendida tatei* was identified using the description of Allen and Cross (1982). There are no previously published records of melanotaenids from the Bulloo-Bancannia, but one specimen of *Melanotaenia* sp. was sampled from the Bulloo River Overflow in 1975 (AMI 18928-002) and *Melanotaenia splendida* was sampled from the Bulloo River in 1983 (QMI 20398). Substantial genetic differentiation between *M. ambigua* in the Barcoo River (possibly a new species), the Murray-Darling and the Dawson-Fitzroy river systems (Musyl and Keenan unpubl. data) demonstrates the need for research into taxonomy and biogeography of inland Australian fishes. No species is endemic to the Bulloo-Bancannia drainage.

A. castelnaui, and *S. barcoo*, have been reported in the Bulloo-Bancannia division (Lake, 1971, 1978; Merrick and Schmida, 1984), but were not sampled during the current study and are not listed in museum records. This may be due to misidentification, inaccurate verbal reports, their absence from this division, their relatively low abundance and/or the limited sampling. Many Australian native fishes have patchy, irregular distributions, and it is likely that fishes in the Bulloo River and other internal drainage divisions undergo very large fluctuations in abundance in response to irregular flooding and long periods of drought that are characteristic of arid, inland Australia. Only *N.*

erebi was abundant in both 1986 and 1989, and *Neosilurus* sp., *L. unicolor* and *B. welchi* were each sampled in only one year (Table 1.)

The fish fauna of the Bulloo-Bancannia division is depauperate compared to that of the two adjacent divisions. Glover (1982) listed 26 indigenous species from 12 families in the Lake Eyre division, and there are approximately 24 native species from 12 families in the Murray-Darling river system (McDowall 1980). In contrast, however, Glover (1982) recorded only seven indigenous species from six families in the vast, arid Western Plateau division. The low species diversity and abundance in the Bulloo-Bancannia and Western Plateau divisions are probably due to the ephemeral nature of both divisions and the relatively small size of the Bulloo-Bancannia.

Although Lake (1971) and Llewellyn and Pollard (1980) stated that water from the Bulloo system reaches the Murray-Darling in times of major flooding, the Bulloo-Bancannia is considered to be a separate drainage division (Anon 1967), and waters from the Bulloo cannot reach tributaries of the Murray-Darling river system even during extensive floods (K. Smith, G. Beaton pers. comm.). At least four indigenous species, *Retropinna semoni*, *Craterocephalus eyresii*, *Craterocephalus stercusmuscarum*, and *Ambassis castelnaui*, and the exotic, *Carassius auratus*, that have been recorded in both the Lake Eyre and Murray-Darling divisions (Glover, 1982; Merrick and Schmida, 1984) have not been recorded from the Bulloo, suggesting that there has been no mixing of fishes between the divisions in recent times. This is

Water quality variable	Sampling Site	
	Thargomindah Sept. 1986	"Como Hole" Sept. 1989
turbidity-secchi disc (m)	0.03	0.05
pH	6.6	7.4
total dissolved solids (ppm)	45	50
alkalinity (ppm)	51	51
Ca hardness (ppm)	17	34
Mg hardness	34	17
total hardness (ppm)	51	51
temperature (°C) at surface	18	19
1m	17.5	17
2m	16.5	14
4m	-	13
dissolved oxygen (ppm) at surface	7.8	7.8
1m	7.8	7.8
2m	6.5	6.2
4m	-	5.5

TABLE 2. Limnology of the Bulloo River

supported by the relatively large numbers of *Bidyanus bidyanus*, *R. semoni* and the exotic *Cyprinus carpio* in Boorara Creek [a tributary of the Murray-Darling system close to the Bulloo division (Fig. 1)] in September, 1989 (Midgley and Midgley, unpubl. data).

The high turbidity of the Bulloo River is characteristic of the surface waters of the internal drainage divisions. The water quality variables were at levels considered suitable for freshwater fishes.

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